PATENT

INSTITUT FRANÇAIS DU PETROLE

METHOD AND SYSTEM INTENDED FOR REAL-TIME ESTIMATION OF THE FLOW MODE OF A MULTIPHASE FLUID STREAM AT ALL POINTS OF A PIPE

Inventors : Emmanuel DURET, Eric HEINTZE and Isabelle REY-FABRET

ABSTRACT

- Method and system intended for real-time estimation of the flow mode, at all points of a pipe whose structure is defined by a certain number of structure parameters, of a multiphase fluid stream defined by several physical quantities.

- A non-linear neural network is formed with an input layer having as many inputs as there are structure parameters and physical quantities, an output layer with as many outputs as there are quantities necessary for estimation of the flow mode and at least one intermediate layer. A learning base is created with predetermined tables connecting various values obtained for the output data to the corresponding values of the input data, with iterative determination of the weighting factors of the activation function allowing to properly connect the values in the input and output data tables. In order to avoid singularities of the network output data likely to distort the determination of the weighting factors, a sorting procedure is used to eliminate non-pertinent data. The main advantages of the method are : modelling simplification and time saving.

- Applications : simplified implementation of hydrodynamic modules that can be integrated in modelling tools for example.